



# Alpha Spectra, Inc.

## Scintillation Detectors

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### ASI-100 PLASTIC SCINTILLATOR

This plastic scintillator combines the two important properties of long optical attenuation length and fast timing and is therefore particularly useful for time-of-flight systems using scintillators greater than one meter long. Typical measurements of 4 meter optical attenuation length are achieved in strips of cast sheet in which a representative size is 2 cm x 20 cm x 300 cm.

The combination of long attenuation length, high light output and an emission spectrum well matched to the common photomultipliers recommends ASI-100 as the detector of choice for many industrial applications such as gauging and environmental protection where high sensitivity of signal uniformity are critical operating requirements.

#### Physical and Scintillation Constants:

Light Output, % Anthracene .....	64
Scintillation Efficiency, photons/1 MeV e <sup>-</sup> .....	10,000
Wavelength of Max. Emission, nm .....	425
Rise Time, ns .....	0.9
Decay Time, ns .....	2.1
Pulse Width, FWHM, ns .....	~2.5
No. of H Atoms per cm <sup>3</sup> , x 10 <sup>22</sup> .....	5.17
No. of C Atoms per cm <sup>3</sup> , x 10 <sup>22</sup> .....	4.69
No. of Electrons per cm <sup>3</sup> , x 10 <sup>23</sup> .....	3.33
Density, g/cc: .....	1.02

**Polymer Base:** ..... Polyvinyltoluene  
**Refractive Index:** .....1.58  
**Vapor Pressure:** ..... Is vacuum-compatible  
**Coefficient of Linear Expansion:** 7.8 x 10<sup>-5</sup> (< +67°C)

**Light Output vs. Temperature:**  
 At +60°C, L.O. = 95% of that at +20°C  
 No change from +20°C to -60°C

**Chemical Compatibility:** Is attacked by aromatic solvents, chlorinated solvents, ketones, solvent bonding cements, etc. It is stable in water, dilute acids and alkalis, lower alcohols and silicone greases. It is safe to use most epoxies and "super glues" with ASI-100.

#### ASI-100 EMISSION SPECTRUM

